ORDER NO. GAD8512037C2

Service Manual

Radio

RF-B20L

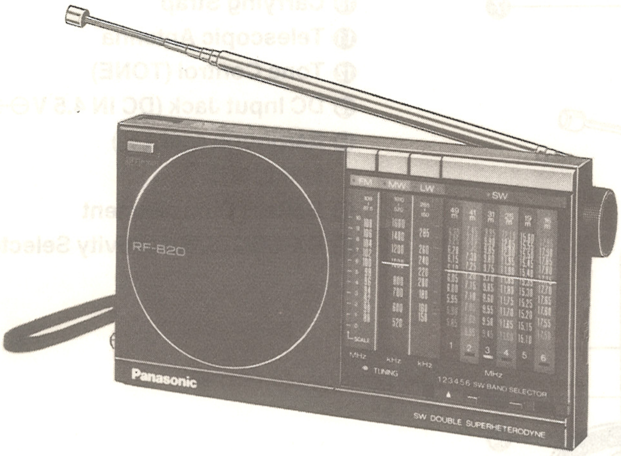
(Black)

FM-MW-LW-SW1~6
9-Band Receiver

This is the Service Manual for the following areas.

Z …For all European areas except United Kingdom.

E …For United Kingdom.



■ SPECIFICATIONS

Frequency Range:	FM; 87.5~108 MHz
	MW; 520~1610 kHz
	LW; 150~285 kHz
	SW1; 5.95~6.20 MHz (49 m)
	SW2; 7.10~7.30 MHz (41 m)
	SW3; 9.50~9.90 MHz (31 m)
	SW4; 11.65~12.05 MHz (25 m)
	SW5; 15.10~15.60 MHz (19 m)
	SW6; 17.55~17.90 MHz (16 m)
Intermediate Frequency:	FM; 10.7 MHz
	AM (MW, LW, SW); 455 kHz
Sensitivity:	462 kHz (For U.K.)
	FM; 2µV/50 mW output (−3 dB, Limit Sens)
	MW; 100 µV/m/50 mW output
	LW; 126 µV/m/50 mW output
	SW1; 1.8 µV/50 mW output
	SW2; 1.3 µV/50 mW output
	SW3; 1.4 µV/50 mW output
	SW4; 1.3 µV/50 mW output
	SW5; 1.3 µV/50 mW output
	SW6; 1.4 µV/50 mW output

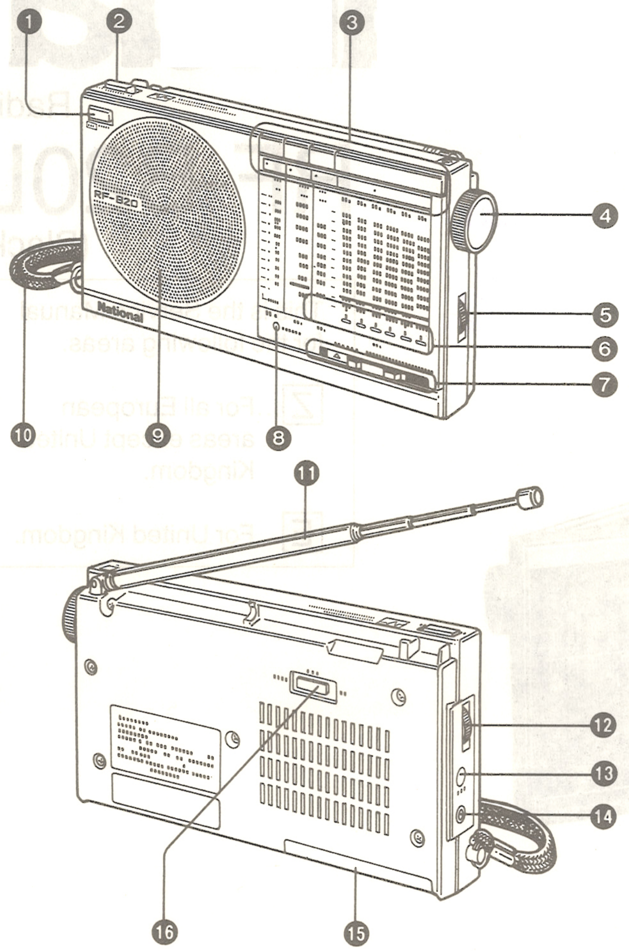
Power Requirement:	Battery; 4.5 V (Three UM-3, "AA" size batteries) (Panasonic UM-3 or equivalent)
	AC; with optional AC adaptor RP-AC4
Power Output:	400 mW (max.)
Speaker:	6.5 cm PM Dynamic Speaker (8Ω)
Impedance:	Earphone; 8Ω, ∅3.5
Dimensions:	[173 (W)×92 (H)×29 (D)] mm
Weight:	320 g without batteries

Design and specifications are subject to change without notice.

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

LOCATION OF CONTROLS AND COMPONENTS



① Power Off Button (OFF POWER)

② Hold Switch (HOLD)

③ FM/MW/LW/SW Band Select Buttons and Indicators
- These buttons also have the function as a power on button.

④ Tuning Control (TUNING)

⑤ Volume Control (VOLUME)

⑥ SW1–6 Band Index Indicator

⑦ SW1–6 Band Selector (SW BAND SELECTOR)

⑧ Tuning Indicator (TUNING)

⑨ Speaker
(6.5 cm 8Ω)

⑩ Carrying Strap

⑪ Telescopic Antenna

⑫ Tone Control (TONE)

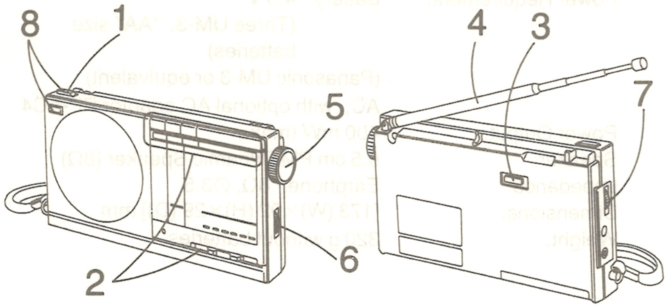
⑬ DC Input Jack (DC IN 4.5 V⊖-◐-⊕)

⑭ Earphone Jack ( )
(∅3.5, 8Ω)

⑮ Battery Compartment

⑯ DX-LOCAL Sensitivity Selector (SENS)

RADIO OPERATION



1. Slide the Hold Switch to the opposite direction of the arrow (HOLD ▶). If this is not done, the Band Select Buttons do not operate.
2. Press the Band Select Button that corresponds to the band on which the programme you want to listen to is being broadcast. When the unit is turned on, the Band Indicator will light up.
   - When you listen to SW broadcast, select the desired meter band by sliding the SW1–6 Band Selector. The SW1–6 Band Index Indicator appears.

   FM......FM band (87.5–108 MHz)
   MW ....Medium wave band (520–1610 kHz)
   LW......Long wave band (150–285 kHz)
   SW ....Short wave bands (Spread meter band system)
   1: 5.95–6.20 MHz (49 m)
   2. 7.10–7.30 MHz (41 m)
   3. 9.50–9.90 MHz (31 m)
   4: 11.65–12.05 MHz (25 m)
   5: 15.10–15.60 MHz (19 m)
   6. 17.55–17.90 MHz (16 m)
3. Set the DX-LOCAL Sensitivity Selector to the proper position for MW, LW and SW reception. Normally set the selector to "DX". When the reception is impaired or there is interference from a powerful station, set the selector to "LOCAL".
   This selector does not function for FM reception.
4. Adjust the antenna. (Refer to "Antennas" on page 3)
5. Tune in your favorite station using the Tuning Control. When tuned in correctly, the Tuning Indicator will light up.
6. Adjust the Volume Control to the desired level.
7. Adjust the Tone Control to the desired tonal quality.
   When this control is moved toward "LOW", the bass is accentuated. When moved toward "HIGH", the treble is accentuated.
8. After use, press the Power Off Button and slide the Hold Switch to the direction of the arrow (HOLD ▶).

Notes:
- When the broadcast signals are weak or the batteries have been exhausted, the Tuning Indicator may not light up even if the sound is still audible through the speaker.
- The Tuning Indicator may come on by mistake when using the unit near a TV receiver (Which has switched on) or near a fluorescent lamp.

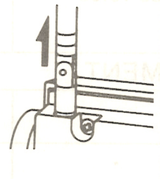
■ Hold Switch

- If you slide the switch to the direction of the arrow (HOLD) after the set has been turned off by pressing the Power Off Button, the set will not be turned on even if the Band Select Buttons are pressed by mistake. This prevents the batteries from being wasted.
  It is useful when carrying the set. Especially before putting the set into the carrying case, be sure to slide the switch to the direction of the arrow (HOLD).
- When listening to the radio, if you slide the switch to the direction of the arrow (HOLD), the other Band Select Buttons and the Power Off Button do not operate. So you can avoid changing the received band or turning the set off by mistake.

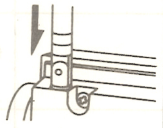
■ Antennas

Caution when adjusting the Telescopic Antenna

- If you wish to adjust the Telescopic Antenna, pull the base of the antenna until you hear a click, and then pull the remaining sections to extend it fully. If this unit is positioned horizontally and used, you will not be able to adjust the antenna unless the base has been pulled free of the set.



- When folding up the antenna, first push the base back into the set and then push the antenna elements back together starting with the thicker ones.



FM:

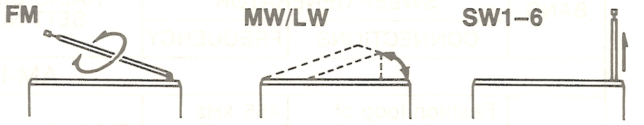
Pull out the Telescopic Antenna and adjust its length and angle for optimum reception.

MW/LW:

The sensitive ferrite core antenna inside the set will provide excellent MW/LW reception in most areas. For optimum reception, turn the set in the direction which gives the best results since the ferrite core antenna is directional.

SW1–6:

Extend the Telescopic Antenna fully, keep it vertical.



■ Listening with the Earphone

Plug the supplied earphone into the Earphone Jack. The Speaker in the radio is automatically disconnected when the plug is inserted.

- Adjust the volume to lower level so as not to injure your ear.

DISASSEMBLY INSTRUCTIONS

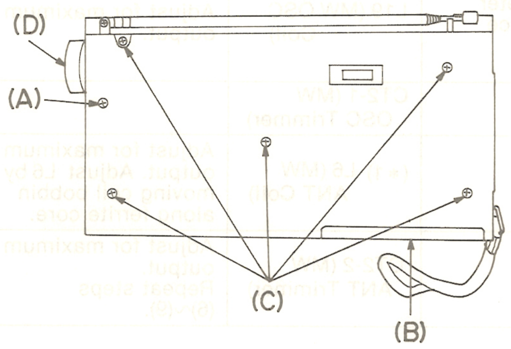


Fig. 1

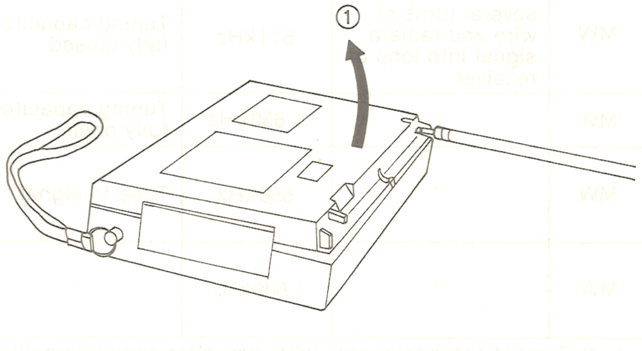


Fig. 2

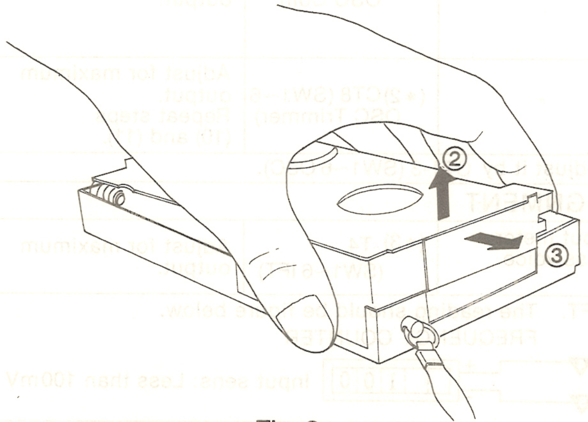


Fig. 3

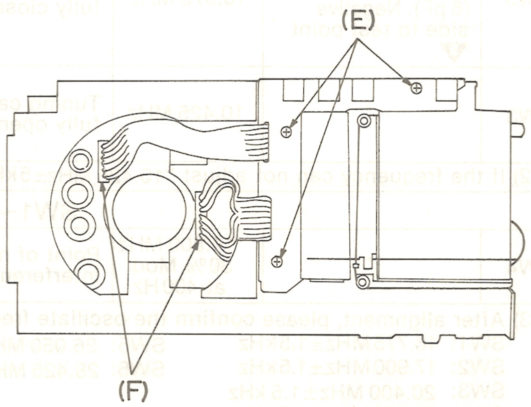


Fig. 4

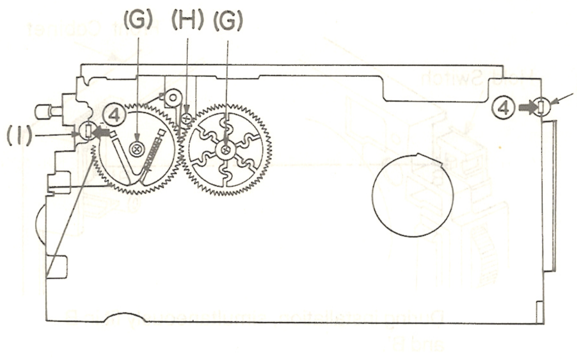


Fig. 5

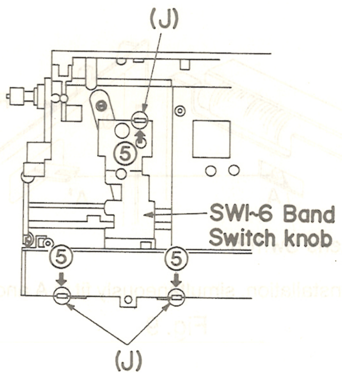


Fig. 6

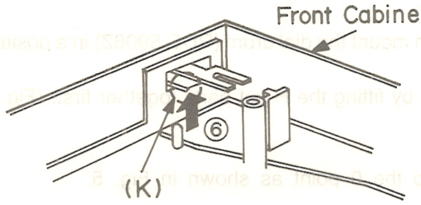


Fig. 7

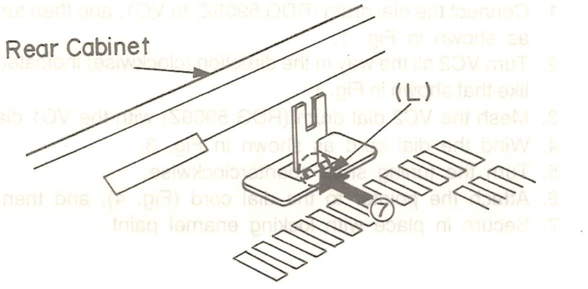
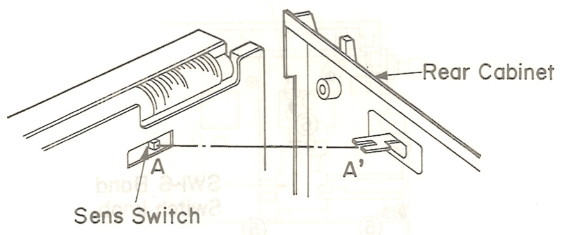


Fig. 8

Ref. No.	Shown in Fig.—.	To remove—.	Remove—.
1	1	Telescopic Antenna	Screw (2.6×14 mm) .... (A)×1
2	1	Rear Cabinet	Battery cover .... (B)×1
3	1		Screw (2.6×14 mm) .... (C)×5
4	2		Remove the rear cabinet in the direction of arrow ①.
5	1	Front Cabinet	Knob .... (D)×1
6	3		Remove the circuit board in the direction of arrow ②, ③.
7	4	LED Circuit Board	Screw (2×4 mm) .... (E)×3
			Connector (CP1, CP2) .... (F)×2
8	5	Main Circuit Board	Screw (1.7×3 mm) .... (G)×2
9	5		Screw (2×8 mm) .... (H)×1
10	5		Remove the rib in the direction of arrow ④. .... (I)×2
11	6	SW1~6 Band Switch Knob (＊1)	Remove the rib in the direction of arrow ⑤. .... (J)×3
12	7	Hold Switch Knob	Remove the rib in the direction of arrow ⑥. .... (K)×1
13	8	Sens Switch Knob	Remove the rib in the direction of arrow ⑦. .... (L)×1

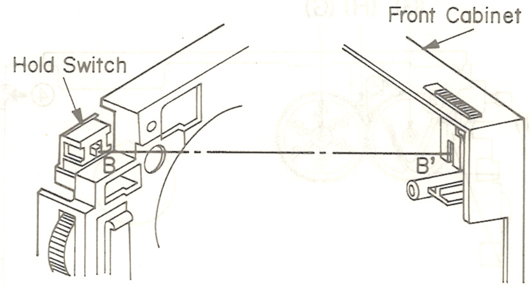
＊1. Remove SW1~6 Band Switch Knob by removing 3 ribs of the chassis as shown in Fig. 6. At this time, be careful not to loose the steel ball and the spring.

■ HOW TO REPLACE



During installation, simultaneously fit in A and A'.

Fig. 9



During installation, simultaneously fit in B and B'.

Fig. 10

DIAL THREADING

1. Connect the dial drum (RDG 5905Z) to VC1, and then turn it all the way in the direction (counterclockwise) indicated by arrow ① as shown in Fig. 1.
2. Turn VC2 all the way in the direction (clockwise) indicated by arrow ②, and then mount the dial drum (RDG 5906Z) in a position like that shown in Fig. 1.
3. Mesh the VC2 dial drum (RDG 5906Z) with the VC1 dial drum (RDG 5905Z) by fitting the H cut parts together first. (Fig. 2)
4. Wind the dial cord as shown in Fig. 3.
5. Turn the tuning shaft counterclockwise.
6. Attach the pointer to the dial cord (Fig. 4), and then slide it downward to the 0 point as shown in Fig. 5.
7. Secure in place with locking enamel paint.

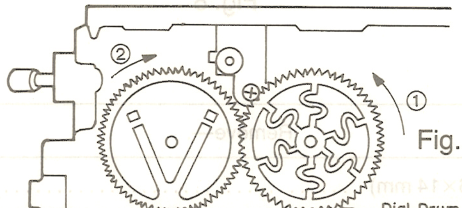


Fig. 1

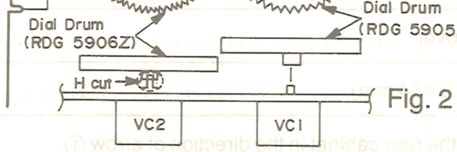


Fig. 2

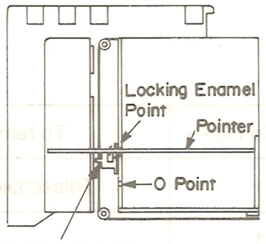


Fig. 5

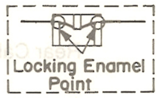


Fig. 4

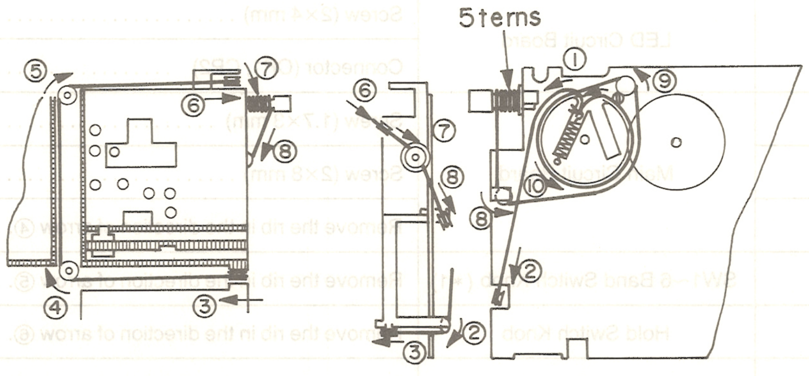


Fig. 3

MEASUREMENTS AND ADJUSTMENTS

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set volume control to maximum.
2. Set tone control to high.
3. Set band switch to LW, MW, SW1~6 or FM.
4. Set hold switch to OFF.
5. Set sens switch to DX.
6. Set power source voltage to 4.5 V DC.
7. Output of signal generator should be no higher than necessary to obtain an output reading.

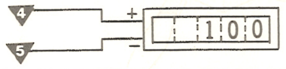
■ LW, MW, SW1~6 ALIGNMENT

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
		CONNECTIONS	FREQUENCY				
	AM-IF ALIGNMENT						
(1)	MW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz (462 kHz... For U.K.) 30% Mod. at 400 Hz	Point of non-interference. (on/about 600 kHz)	Output meter across voice coil.	T2 (AM IFT)	Adjust for maximum output.
	LW-RF ALIGNMENT						
(2)	LW	〃	136 kHz	Tuning capacitor fully closed.	〃	L20 (LW OSC Coil)	Adjust for maximum output.
(3)	LW	〃	297 kHz	Tuning capacitor fully open.	〃	CT1-1 (LW OSC Trimmer)	〃
(4)	LW	〃	150 kHz	Tune to signal.	〃	(∗1) L7 (LW ANT Coil)	Adjust for maximum output. Adjust L7 by moving coil bobbin along ferrite core.
(5)	LW	〃	285 kHz	〃	〃	CT1-2 (LW ANT Trimmer)	Adjust for maximum output. Repeat steps (2)~(5).
	MW-RF ALIGNMENT						
(6)	MW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	511 kHz	Tuning capacitor fully closed.	Output meter across voice coil.	L19 (MW OSC Coil)	Adjust for maximum output.
(7)	MW	〃	1,650 kHz	Tuning capacitor fully open.	〃	CT2-1 (MW OSC Trimmer)	〃
(8)	MW	〃	550 kHz	Tune to signal.	〃	(∗1) L6 (MW ANT Coil)	Adjust for maximum output. Adjust L6 by moving coil bobbin along ferrite core.
(9)	MW	〃	1,500 kHz	〃	〃	CT2-2 (MW ANT Trimmer)	Adjust for maximum output. Repeat steps (6)~(9).
	(∗1) Cement antenna bobbin with wax after completing alignment.						
	SW1~6 2nd LOCAL OSC ALIGNMENT						
(10)	SW3	Connect to test point ▼1 through ceramic capacitor (6 pF). Negative side to test point ▼2.	10.975 MHz	Tuning capacitor fully closed.	〃	L21 (SW1~6 OSC Coil)	Adjust for maximum output.
(11)	SW3	〃	10.425 MHz	Tuning capacitor fully open.	〃	(∗2) CT8 (SW1~6 OSC Trimmer)	Adjust for maximum output. Repeat steps (10) and (11).
	(∗2) If the frequency can not adjust "10.425 MHz±5 kHz" please re-adjust it by CT1-3 (SW1~6 OSC).						
	SW1~6 1st IF ALIGNMENT						
(12)	SW4	〃	11.800 MHz 30% Mod. at 400 Hz	Point of non-interference.	Output meter across voice coil.	(∗3) T4 (SW1~6 IFT)	Adjust for maximum output.

(∗3) After alignment, please confirm the oscillate frequency of T4 IFT. The reading should be figure below.

SW1: 16.775 MHz±1.5 kHz	SW5: 26.050 MHz±1.5 kHz
SW2: 17.900 MHz±1.5 kHz	SW6: 28.425 MHz±1.5 kHz
SW3: 20.400 MHz±1.5 kHz	
SW4: 22.550 MHz±1.5 kHz	

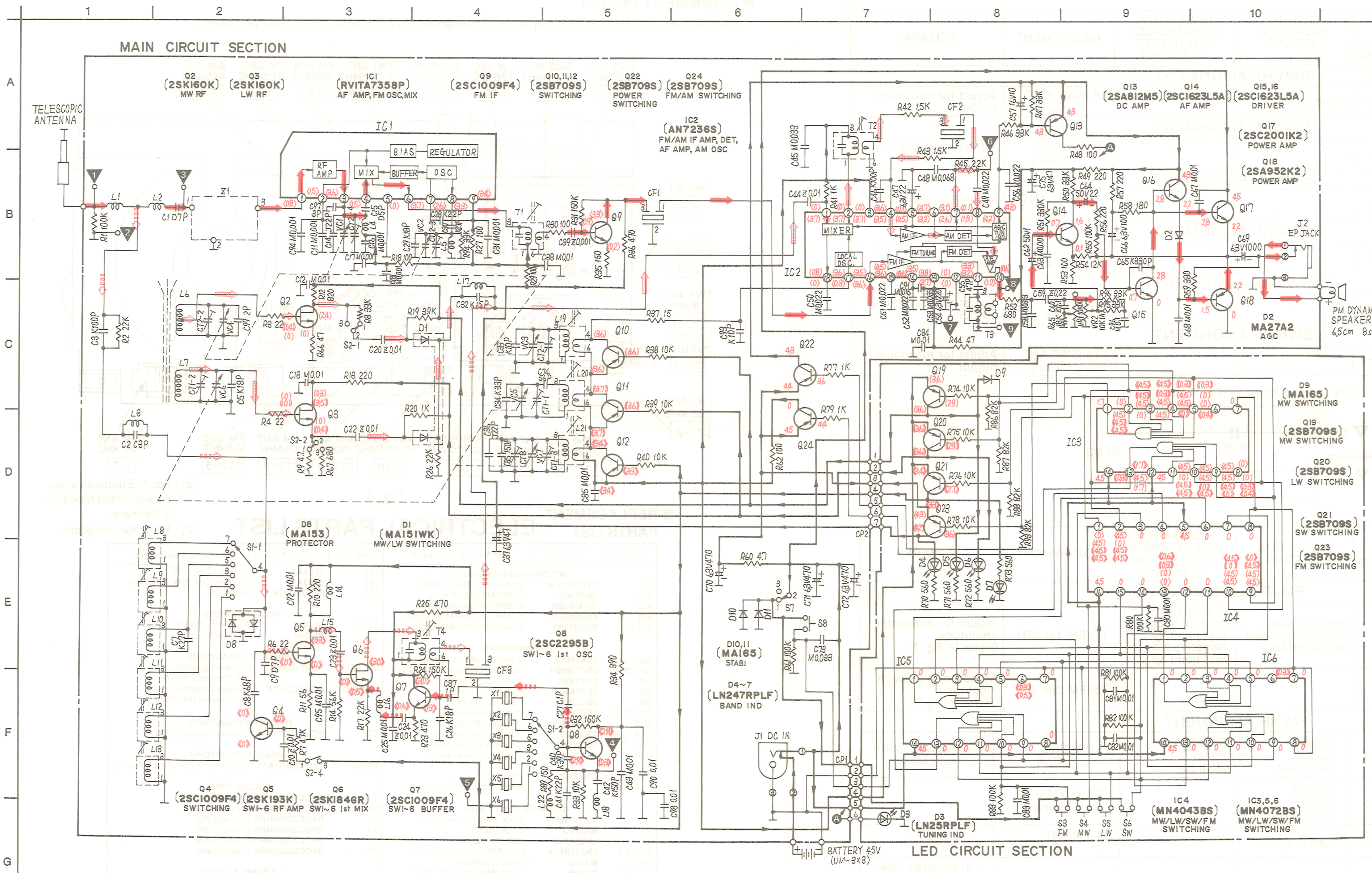
FREQUENCY COUNTER



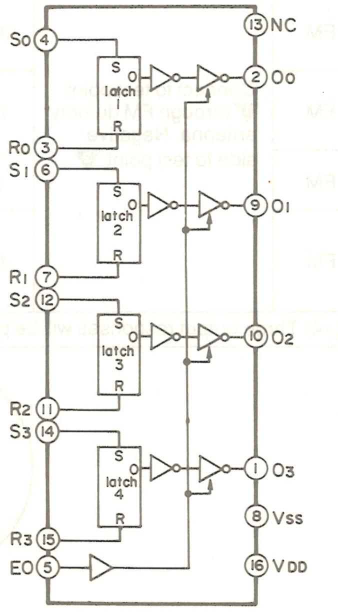
Input sens: Less than 100 mV

▼ Be sure to fold at the (▼) mark so that mark is on the outside.

SCHEMATIC DIAGRAM


MAIN CIRCUIT SECTION
LED CIRCUIT SECTION
TELESCOPIC ANTENNA
Q2 (2SK160K) MW RF
Q3 (2SK160K) LW RF
IC1 (RVITA7358P) AF AMP, FM OSC, MIX
Q9 (2SC1009F4) FM IF
Q10,11,12 (2SB709S) SWITCHING
Q22 (2SB709S) POWER SWITCHING
Q24 (2SB709S) FM/AM SWITCHING
IC2 (AN7236S) FM/AM IF AMP, DET, AF AMP, AM OSC
Q13 (2SA812M5) DC AMP
Q14 (2SC1623L5A) AF AMP
Q15,16 (2SC1623L5A) DRIVER
Q17 (2SC2001K2) POWER AMP
Q18 (2SA952K2) POWER AMP
D2 MA27A2 AGC
J2 EP JACK
PM DYNAMIC SPEAKER 6.5cm 8Ω
RF AMP
MIX
BUFFER
OSC
BIAS
REGULATOR
MIXER
LOCAL OSC.
AM DET
FM DET
D9 (MA165) MW SWITCHING
Q19 (2SB709S) MW SWITCHING
Q20 (2SB709S) LW SWITCHING
Q21 (2SB709S) SW SWITCHING
Q23 (2SB709S) FM SWITCHING
IC3
IC4
IC5
IC6
D8 (MA153) PROTECTOR
D1 (MA151WK) MW/LW SWITCHING
Q8 (2SC2295B) SW1~6 1st OSC
D10,11 (MA165) STABI
D4~7 (LN247RPLF) BAND IND
J1 DC IN
D3 (LN25RPLF) TUNING IND
BATTERY 4.5V (UM-3×3)
S3 FM
S4 MW
S5 LW
S6 SW
IC4 (MN4043BS) MW/LW/SW/FM SWITCHING
IC3,5,6 (MN4072BS) MW/LW/SW/FM SWITCHING
Q4 (2SC1009F4) SWITCHING
Q5 (2SK193K) SW1~6 RF AMP
Q6 (2SK184GR) SW1~6 1st MIX
Q7 (2SC1009F4) SW1~6 BUFFER
S1-1
S1-2
S2-1
S2-2
S2-4
S7
S8
CF1
CF2
CF3
CP1
CP2
1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G H O

IC4
MN4043BS


So ④
Ro ③
S1 ⑥
R1 ⑦
S2 ⑫
R2 ⑪
S3 ⑭
R3 ⑮
EO ⑤
⑬ NC
② O0
⑨ O1
⑩ O2
① O3
⑧ Vss
⑯ VDD
S latch 1 R
S latch 2 R
S latch 3 R
S latch 4 R

Notes:

1. S1-1, S1-2: SW1~6 Band switch in "SW1" position. (1…SW6, 2…SW5, 3…SW4, 5…SW3, 6…SW2, 7…SW1)
2. S2-1~S2-4: DX-Local Sensitivity Switch in "Local" position. (1…Local, 3…DX)
3. S3: FM Band switch in "OFF" position.
4. S4: MW Band switch in "OFF" position.
5. S5: LW Band switch in "OFF" position.
6. S6: SW Band switch in "OFF" position.
7. S7: Hold Switch in "OFF" position. (1…OFF, 3…ON)
8. S8: Power OFF switch.
9. VR1: Tone control VR.
10. VR2: Volume control VR.
11. The mark (▼) shows test point e.g. ▼1 = test point 1.
12. DC voltage measurement are taken with electronics voltmeter from negative terminal of battery.
    < >…FM position, ( )…MW position
    (( ))…LW position, ≪ ≫…SW position
    No mark…FM/MW/LW/SW position
13. Battery current: No signal .... 35 mA
    Maximum output .... 139 mA

- Described in schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type number is used for supply parts number and production parts number which they are identical.

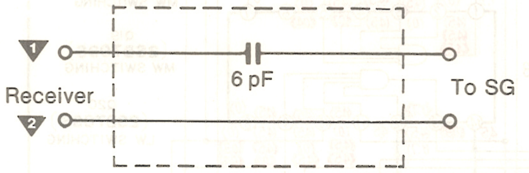
e.g. **Q1**
2SC2412NRTB, LNSTB ← Production parts number
[2SC2412] ← Supply parts number

- The supply parts number is described alone in the replacement parts list.

➡ +B Voltage Line
⇨ LW Signal Line
▭▭▷ SW1~6 Signal Line
➡ Radio (FM) Signal Line
⇨ MW Signal Line
■■➡ 1st OSC Signal Line

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
		CONNECTIONS	FREQUENCY				
	SW1-RF ALIGNMENT						
(13)	SW1	″	6.075 MHz	Tune to signal.	″	L8 (SW1 ANT Coil)	Adjust for maximum output.
	SW2-RF ALIGNMENT						
(14)	SW2	″	7.20 MHz	″	″	L9 (SW2 ANT Coil)	Adjust for maximum output.
	SW3-RF ALIGNMENT						
(15)	SW3	″	9.70 MHz	″	″	L10 (SW3 ANT Coil)	Adjust for maximum output.
	SW4-RF ALIGNMENT						
(16)	SW4	″	11.85 MHz	″	″	L11 (SW4 ANT Coil)	Adjust for maximum output.
	SW5-RF ALIGNMENT						
(17)	SW5	″	15.35 MHz	″	″	L12 (SW5 ANT Coil)	Adjust for maximum output.
	SW6-RF ALIGNMENT						
(18)	SW6	″	17.725 MHz	″	″	L13 (SW6 ANT Coil)	Adjust for maximum output.

SW Dummy Antenna (For Steps (10)~(18))



▼1
▼2
To Receiver
6 pF
To SG

■ FM ALIGNMENT

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
		CONNECTIONS	FREQUENCY				
	FM-IF ALIGNMENT						
(19)	FM	Connect to test point ▼3 through 0.001μF. Negative side to test point ▼2 .	10.7 MHz (SWP.)	Point of non-interference. (on/about 90 MHz)	Connect vert. amp. of scope to test point ▼8 . Negative side to test point ▼9 .	T1 (FM 1st IFT)	Adjust for maximum amplitude. (Refer to fig. 1.)
(20)	FM	″	″	″	″	T3 (FM 2nd IFT)	Adjust for maximum amplitude. (Refer to fig. 2.)
	FM-RF ALIGNMENT						
(21)	FM	Connect to test point ▼1 through FM dummy antenna. Negative side to test point ▼2 .	87.5 MHz	Variable capacitor fully closed.	Output meter across voice coil.	L5 (FM OSC Coil)	(*4) Adjust for maximum output.
(22)	FM		108 MHz	Variable capacitor fully open.	″	CT2–3 (FM OSC Trimmer)	″
(23)	FM		90 MHz	Tune to signal.	″	L4 (FM ANT Coil)	″
(24)	FM		106 MHz	Tune to signal.	″	CT2–4 (FM ANT Trimmer)	(*4) Adjust for maximum output. Repeat steps (21)~(24).

(*4) Three output responses will be present; proper tuning is the center frequency.

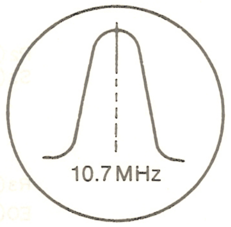


Fig. 1

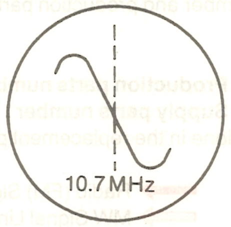
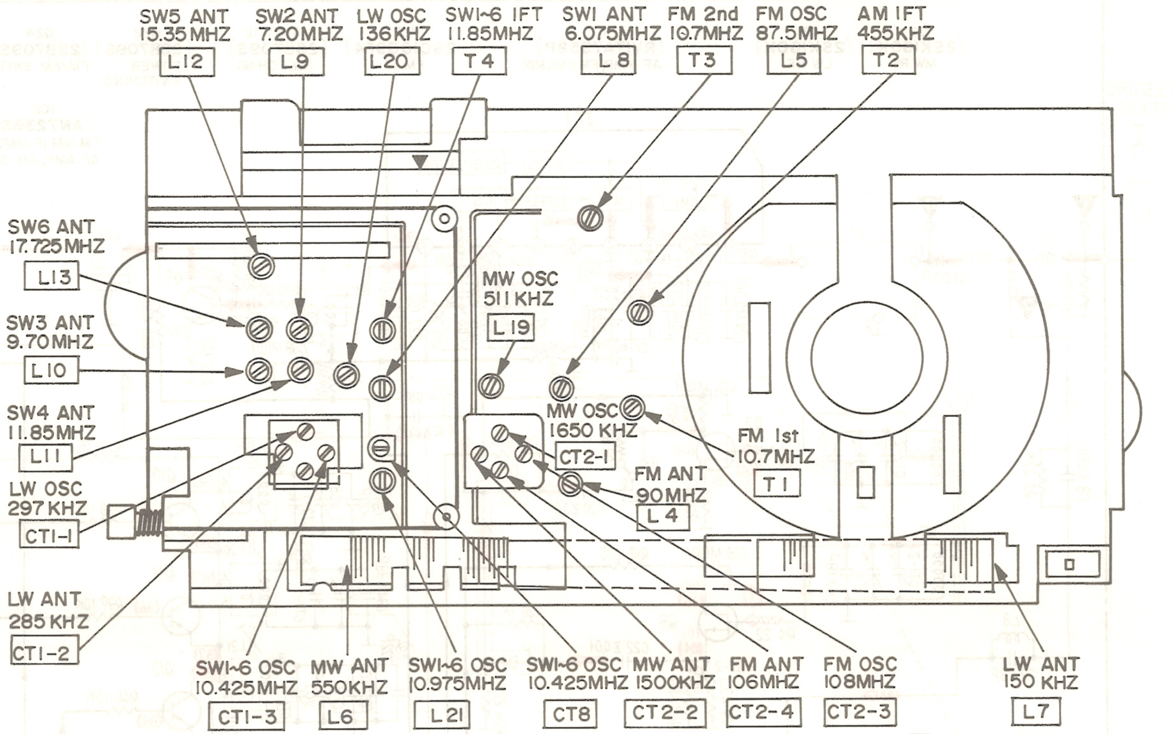


Fig. 2

■ ALIGNMENT POINTS

- Please refer to Circuit Board and Wiring Connection Diagram which is located test point.



SW5 ANT 15.35 MHZ L12
SW2 ANT 7.20 MHZ L9
LW OSC 136 KHZ L20
SW1~6 IFT 11.85 MHZ T4
SW1 ANT 6.075 MHZ L8
FM 2nd 10.7 MHZ T3
FM OSC 87.5 MHZ L5
AM IFT 455 KHZ T2
SW6 ANT 17.725 MHZ L13
SW3 ANT 9.70 MHZ L10
SW4 ANT 11.85 MHZ L11
LW OSC 297 KHZ CT1-1
LW ANT 285 KHZ CT1-2
MW OSC 511 KHZ L19
MW OSC 1650 KHZ CT2-1
FM 1st 10.7 MHZ T1
FM ANT 90 MHZ L4
SW1~6 OSC 10.425 MHZ CT1-3
MW ANT 550 KHZ L6
SW1~6 OSC 10.975 MHZ L21
SW1~6 OSC 10.425 MHZ CT8
MW ANT 1500 KHZ CT2-2
FM ANT 106 MHZ CT2-4
FM OSC 108 MHZ CT2-3
LW ANT 150 KHZ L7

Fig. 3

■ REPLACEMENT PARTS LIST

ELECTRICAL PARTS LIST

Z…For All European areas except United Kingdom & Germany.

E…For United Kingdom.

Ref. No.	Part. No.	Part Name & Description
	INTEGRATED CIRCUITS	
IC1	**RViTA7358P**	IC (AF AMP/FM OSC/MIX)
IC2	**AN7236S**	IC (FM/AM IF AMP etc.)
IC3	**MN4082BS**	IC (MW/LW/SW/FM Switching)
IC4	**MN4043BS**	IC (MW/LW/SW/FM Switching)
IC5,6	**MN4072BS**	IC (MW/LW/SW/FM Switching)
	TRANSISTORS	
Q2,3	**2SK160K5**	Transistor (MW RF, LW RF)
Q4,7,9	**2SC1009F4**	Transistor (Switching, Buffer, FM IF)
Q5	**2SK193K**	Transistor (RF AMP)
Q6	**2SK184GR**	Transistor (1st Mix)
Q8	**2SC2295B**	Transistor (1st OSC)
Q10,11,12	**2SB709S**	Transistor (Switching)
Q13	**2SA812M5**	Transistor (DC AMP)
Q14,15,16	**2SC1623L5A**	Transistor (AF AMP, Driver)
Q17	**2SC2001K2**	Transistor (Power AMP)
Q18	**2SA952K2**	Transistor (Power AMP)
Q19,20,21, 22,23,24	**2SB709S**	Transistor (MW/LW/SW/FM Switching)
	DIODES & RECTIFIERS	
D1	**MA151WK**	Diode (MW/LW Switching)
D2	**MA27A2**	Diode (AGC)
D3	**LN25RPLF**	LED (Tuning)
D4,5,6,7	**LN247RPLF**	LED (FM/MW/LW/SW Band)
D8	**MA153**	Diode (Protector)
D9,10,11	**MA165**	Diode (MW Switching, Stabi)
	COILS	
L1	**RLQY25S5**	Choke Coil
L2	**RLQY30S1**	Choke Coil
L3,16	**RLQY10G5**	Choke Coil
L4	**RL04N120**	Antenna Coil, (FM)
L5	**RL04N162**	Oscillator Coil, (FM)
L6,7	**RLF6B3**	Antenna Coil, (MW)
L8	**RLA3A8**	Antenna Coil, (SW1)
L9	**RLA3A9**	Antenna Coil, (SW2)
L10,11	**RLA3A11**	Antenna Coil, (SW3, SW4)
L12	**RLA3A12**	Antenna Coil, (SW5)
L13	**RLA3A13**	Antenna Coil, (SW6)
L14	**RLQZP100K**	Choke Coil
L15	**RLQZP2R2M**	Choke Coil
L17	**RLQZP150K**	Choke Coil
L18	**RLQZP8R2K**	Choke Coil
L19	**RL02A10**	Oscillator Coil, (MW)
L20	**RL01A3**	Oscillator Coil, (LW)
L21	**RL03A10**	Oscillator Coil, (SW 2nd Local)
L22	**RLQZG102K**	Choke Coil
	TRANSFORMERS	
T1,3,4	**RLi4A4**	IFT (FM IF, SW IF)
T2	**RLi2A8**	IFT (MW IF)
	VARIABLE CAPACITORS	
VC1 (CT1)	**RCV3YC4VN**	Variable Capacitor with Trimmer (LW/SW)
VC2 (CT2)	**RCV4LC4V1N**	Variable Capacitor with Trimmer (FM/MW)
	TRIMMER CONDENSER	
CT8	**RCVCTZ3110**	Trimmer Capacitor (SW)
	VARIABLE RESISTORS	
VR1,2	**EVUJ05T02A14**	Tone/Volume Control VR 10 kΩ (A)
	RESONATORS	
X1	**RVCC16775NRN**	Crystal (SW1)
X2	**RVCC17900NRN**	Crystal (SW2)
X3	**RVCC20400NRN**	Crystal (SW3)
X4	**RVCC22550NRN**	Crystal (SW4)
X5	**RVCC26050NRN**	Crystal (SW5)
X6	**RVCC28425NRN**	Crystal (SW6)
	CERAMIC FILTERS	
CF1	**RVF107NAR**	Ceramic Filter (FM)
CF2 Z	**RVFSFP455G5**	Ceramic Filter (MW)
E	**RVFSFP462G5**	Ceramic Filter (MW)
CF3	**RVF107SM1**	Ceramic Filter (SW)
	FILTER	
Z1	**RXABPMB6A**	Component Combinations
	SWITCHES	
S1	**RSS6B02Z**	Slide Switch (SW1~6 Band Selector)
S2	**RSS2D11Z**	Slide Switch (DX/Local Sens)
S3,4,5,6	**RSH1A48Y**	Push Switch (Band Selector)
S7	**RSS2A37Z**	Slide Switch (Hold)
S8	**RSH1A28Z**	Push Switch (Power OFF)
	JACKS	
J1	**RJJ1B1Z**	Jack (DC IN)
J2	**RJJ1D3Y**	Jack (Earphone)

ELECTRICAL PARTS LIST

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value (100Ω)
ERX	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value (2.2Ω)

Resistor Type	Wattage	Tolerance
ERD: Carbon ERD: Metal Film ERX: Metal Film ERQ: Fuse Type Metal RRD: Carbon (Chip Type)	10 : ⅛ W 12 : ½ W 25 : ¼ W 1 : 1 W 18 : ⅛ W	J : ±5%

Numbering System of Capacitor

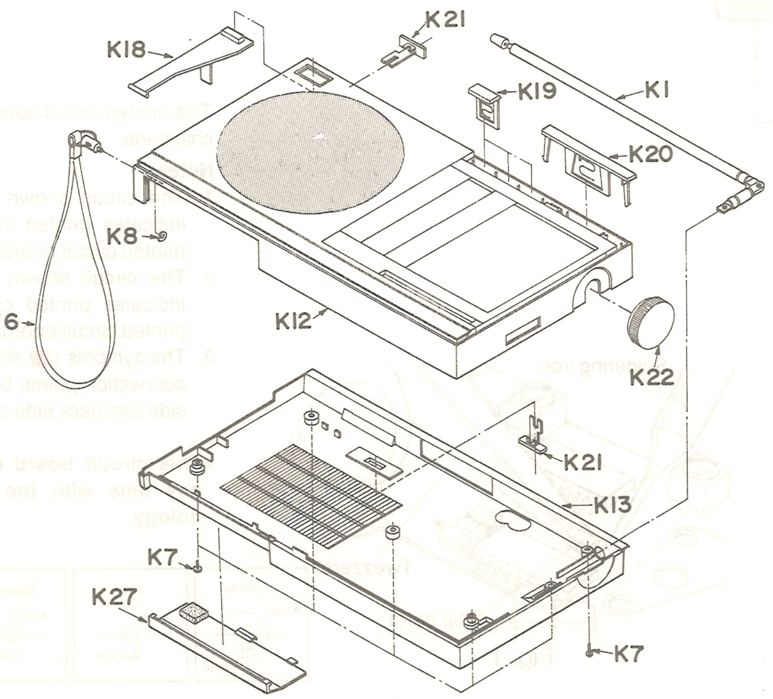
Example

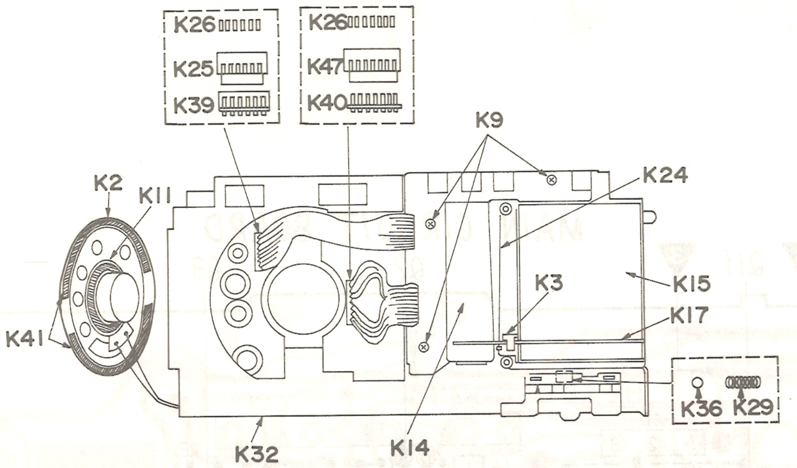
ECKD	1H	102	Z	F
Type	Voltage	Value (1000 pF)	Tolerance	Peculiarity
ECEA	50	M	R47	
Type	Voltage	Peculiarity	Value (0.47 μF)	

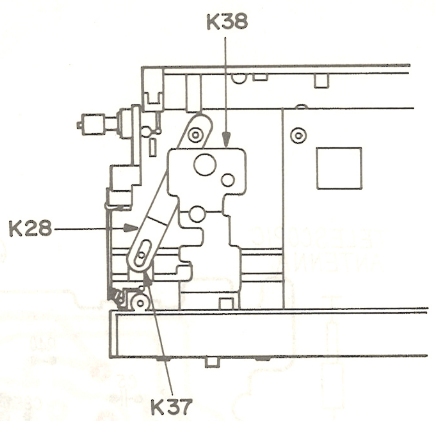
Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA: Electrolytic ECCD: Ceramic ECKD: Ceramic ECQM: Polyyester ECQP: Polyproylene ECET: Electrolytic ECEA□□□N: Non Polar Electrolytic QCU □: Ceramic (Chip Type) ECUX: Ceramic (Chip Type)	OJ : 6.3 V 1A : 10 V 1C : 16 V 1E : 25 V 1H : 50 V 1V : 35 V 50 : 50 V 25 : 25 V 16 : 16 V	2H : 500 V DC 1 : 100 V DKC : 400 V AC	C : ±0.25 pF J : ±5% K : ±10% Z : +80%, −20% P : +100%, −0%

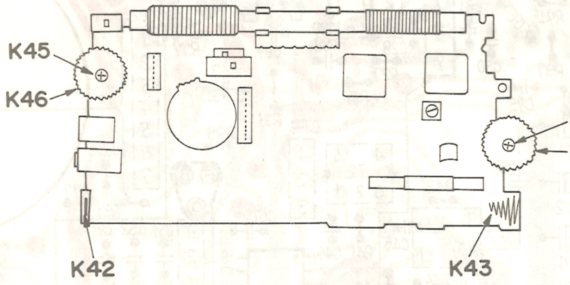
Ref. No.	Part. No.
CAPACITORS	
C1,9	RCUX1H070DC
C2	RCUX1H030CC
C3	RCUX1H101K
C5,26,29	RCUX1H180KC
C7	RCUX1H270KC
C8	RCUX1H680KC
C10,20,22,23,24, 44	RCUX1H103ZF
C11,16,31,63,94	RCUX1H102MD
C12,13,25,38,67, 68,92,95	RCUX1E103MD
C14	RCUX1H220JC
C15	RCUX1H050DC
C17,18	RCUX1H102MD
C27	RCUX1H010CC
C28	RCUX1H220KC
C30	RCUX1H470KC
C32	RCUX1H150KC
C33,93	RCUX1H100KC
C34	RCUX1H330KC
C35	ECMS05151J
C36	RCUX1H220J
C37	ECEA0JK470
C39	RCUX1H102ZF
C40	RCUX1H390KC
C41	RCUX1H220KC
C42	RCUX1H151K
C43,84,85	RCUX1E103MD
C45,53,58,73	ECUX1E333MD
C46	RCUX1H101K
C47	ECEA0JK220
C48	ECUX1E683MD
C49	ECUX1H223MD
C50,51,52,56	ECUX1H223MD
C54	ECEA0JK221
C55	RCUX1H470KC
C57	ECEA1CKS100
C59	ECUX1E224ZF
C60	ECUX1E104ZF
C62	ECEA1HKS010
C64	ECEA1HKS2R2
C65	RCUX1H331K
C66	ECEA0JKS101
C69	ECEA0JU102
C70	ECEA0JU471
C71,72	ECEA0JSS471
C74	ECCD1H560K
C75	ECEA0JKS470
C80,81,82,83	RCUX1E103MD
C87	RCUX1H010CC
C90,98	ECFT1C103MD
C91	ECUX1H153MD
C96	ECUX1E104MD
C97	RCUX1H030CC
C99	RCUX1H020CC
RESISTORS	
R1,55,61	ERJ6GCJ104
R2	ERJ6GCJ223
R3,4,6	ERJ6GCJ220
R7	ERJ6GCJ473
R8	ERJ6GCJ333
R9,60	ERJ6GCJ4R7
R10,13,25,49,56, 57	ERJ6GCJ221
R11	ERJ6GCJ560
R12	ERJ6GCJ821
R14	ERJ6GCJ563
R17	ERJ6GCJ222
R18,27,30,48,53	ERJ6GCJ101
R19	ERJ6GCJ392
R20,41,77,79	ERJ6GCJ102
R23	ERJ6GCJ471
R24,31,32	ERJ6GCJ154
R26,45	ERJ6GCJ222
R29,62	ERJ6GCJ101
R33,38,39,40	ERJ6GCJ103
R34	ERJ6GCJ391
R35	ERJ6GC151
R36	ERJ6GCJ471
R37	ERJ6GCJ150
R42,43	ERJ6GCJ152
R44	ERJ6GCJ470
R46	ERJ6GCJ332
R47	ERJ6GCJ333
R50,94,95,96	ERJ6GCJ332
R51	ERJ6GCJ334
R52,67	ERJ6GCJ681
R54	ERJ6GCJ123
R58	ERJ6GCJ181
R59	ERJ6GCJ331
R65	ERJ6GCJ183
R66	ERJ6GCJ470
R70,71,72,73	ERJ6GCJ561
R74,75,76,78	ERJ6GC103
R80,81,82,83	ERJ6GCJ104
R86,87,88,93	ERJ6GCJ823
R89	ERJ6GCJ151
CHIP JUMPERS	
RJ1,2,5,7,8	RRD18XK000
RJ4,9,10,11,15	ERJ6GCJ000

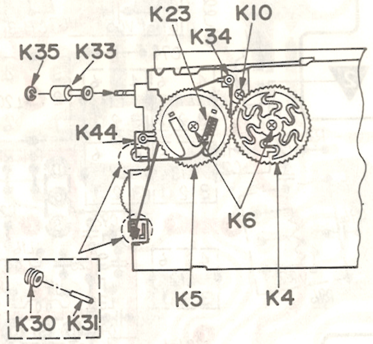
CABINET PARTS LOCATION











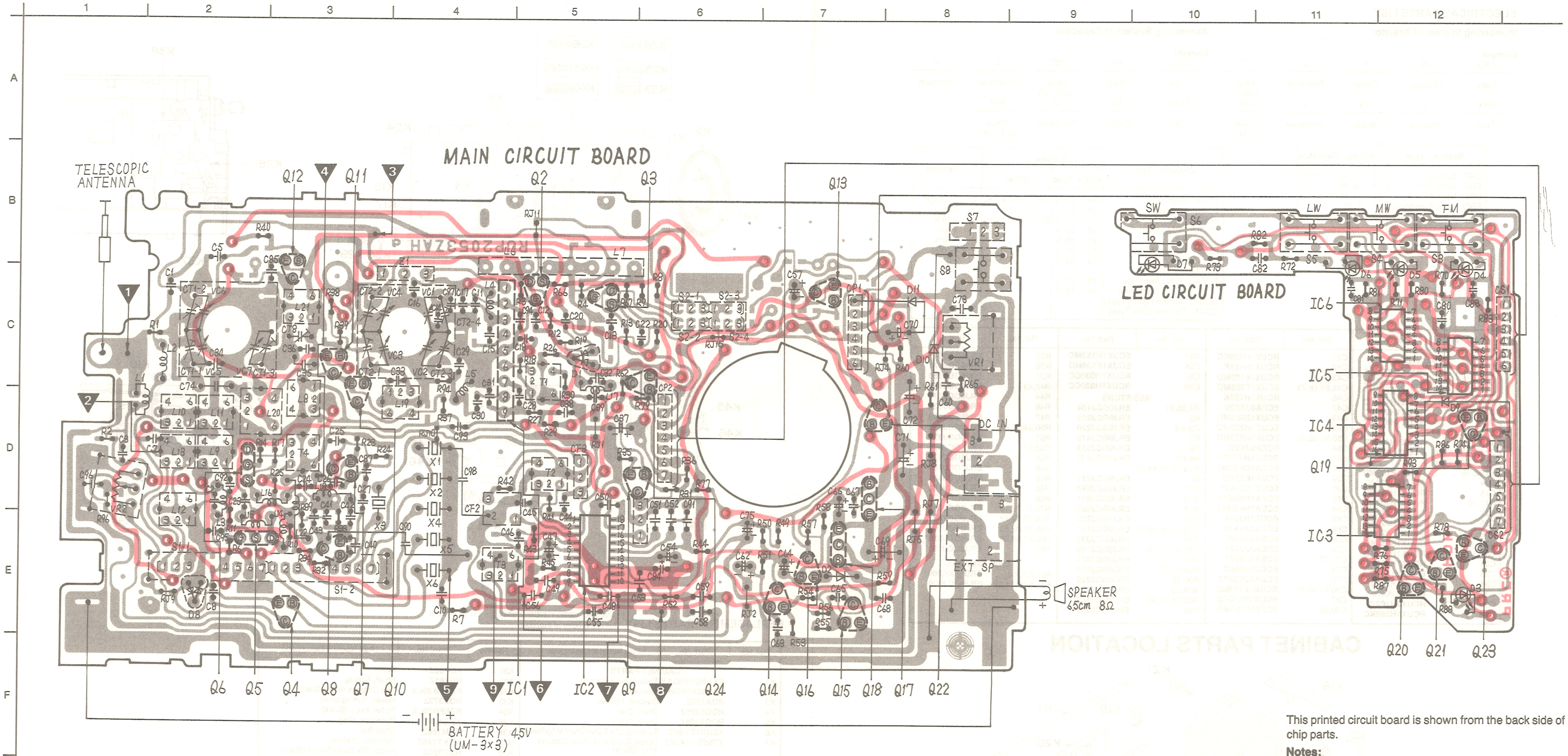
REPLACEMENT PARTS LIST

Note:
The color name in parentheses ( ) in the parts list is the color of that part.

Ref. No.	Part. No.	Part Name & Description
CABINET PARTS		
K1	XEARS125GAY	Telescopic Antenna
K2	EAS65P76GB	Speaker
K3	RDA105Z	Bracket, Pointer
K4	RDG5905Z	Drum, Dial
K5	RDG5906Z	Drum, Dial
K6	XSHR17+3FZ	Screw ⊕1.7×2, Dial Drum M'tg (Black)
K7	XTN26+14JFZ	Screw ⊕ 2.6×14, Rear Cabinet M'tg (Black)
K8	XUC2FT	Stop Ring (2∅), Hand Strap M'tg
K9	XQN2+AJ4	Screw ⊕ 2×4, Dial Scale M'tg
K10	XQS2+AJ8	Screw ⊕ 2×8, P.C.B. M'tg
K11	RHG1150Z	Rubber Cushion, Speaker
K12	RYMFB20LZ	Front Cabinet Ass'y (Black)
K13	RKF812Y	Rear Cabinet (Black)
K14	RKD697Y	Dial Scale, MW (Black)
K15	RKD698Z	Dial Scale, SW (Black)
K16	RKH96Y	Hand Strap (Black)
K17	RDP907Z	Pointer (Silver)
K18	RBC860Z	Button, Power OFF (Green)
K19	RBC868Z	Button, Band
K20	RBC869Z	Button, Band
K21	RBD381Z	Knob, Hold, SENS (Black)
K22	RBN736Z	Knob, Tuning (Black)
K23	RUD49Z	Spring, Dial
K24	RDZ03Y	Cord, Dial (60 cm)
K25	RJS6L4Z	Socket (6P)
K26	RJT807Y	Contact
K27	RYNFB20LX	Battery Cover Ass'y (Black)
K28	RUB423Z	Lever, Indicator
K29	RDS2042Z	Coil Spring
K30	RDR82Z	Roller
K31	RDY61Z	Shaft, Tuning
K32	RZAFB20LX	Dial Chassis Ass'y (Black)
K33	RDX372Z	Roller, Tuning Shaft
K34	RZEFB20LX	Roller Ass'y (Black)
K35	XUC12FT	Retaining Ring
K36	RHM156Z	Steel Ball
K37	RGK1246Z	Indicator (Yellow)
K38	RBD380Z	Knob, SW Band Switch (Black)
K39	RJP6G10Z	Plug (6P)
K40	RJP7G10Z	Plug (7P)
K41	RHG1153Z	Rubber Cushion
K42	RJC370Z	Battery Terminal (+)
K43	RJC70006Z	Battery Spring (−)
K44	QJT1022	Lug Terminal
K45	XSHR17+2FZ	Screw, Volume/Tone Knob M'tg (Black)
K46	RBT260Z	Knob, Volume/Tone (Black)
K47	RJS7L4Z	Socket (7P)
ACCESSORIES		
A1	XEH1A1-X	Earphone
A2	RQX4727Z	Instruction Book
A3	RQD228Y	Carrying Case (Gray)
PACKINGS		
P1	RPK2202Z	Gift Box
P2	RPN4873Z	Cushion
P3	RPN4874Z	Cushion (Upper)
P4	XZB15X25A01	Protection Cover (for UNIT)

GAD
Y.M. ZE Printed in Japan Ⓕ

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

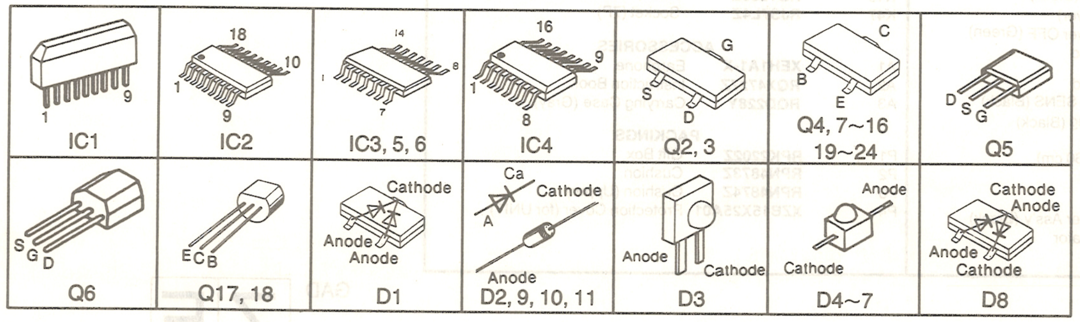

1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
TELESCOPIC ANTENNA
MAIN CIRCUIT BOARD
LED CIRCUIT BOARD
Q12
Q11
Q2
Q3
Q13
Q6
Q5
Q4
Q8
Q7
Q10
IC1
IC2
Q9
Q24
Q14
Q16
Q15
Q18
Q17
Q22
Q19
Q20
Q21
Q23
IC3
IC4
IC5
IC6
SW
LW
MW
FM
S6
S7
S8
S5
D4
D5
D6
D7
D8
D9
D10
D11
VR1
VR2
X1
X2
X3
X4
X5
X6
CF1
CF2
DC IN
EXT SP
SPEAKER 6.5cm 8Ω
BATTERY 4.5V (UM-3×3)
S1-1
S1-2
S2-1
S2-2
S2-3
S2-4

This printed circuit board is shown from the back side of chip parts.

Notes:

1. The circuit shown in (▬) on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in (▬) on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols (●) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.

- **This circuit board diagram may be modified at any time with the development of new technology.**


IC1
IC2
IC3, 5, 6
IC4
Q2, 3
Q4, 7~16
19~24
Q5
Q6
Q17, 18
D1
D2, 9, 10, 11
D3
D4~7
D8
Cathode
Anode
Ca
A
G
S
D
C
B
E
ECB

■ Replacing Chip Parts

(Removal) Hold the chips with tweezers as shown in Fig. 1, and alternately touch the soldering iron (for less than three seconds) to the soldered part on either side of the chip. Gradually lift the chip up and remove it.
Caution: Removing the chips all at once will break the plating on the circuit board.

(Attachment) Carefully solder the replacement parts to the same location (do not permit the parts to shift).
Note: If allowed to shift, the part may interfere with the mechanism.

***Use only one millimeter at the end of the soldering iron**

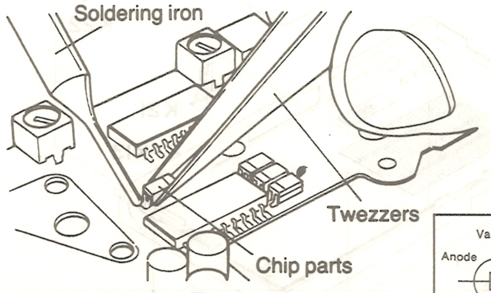
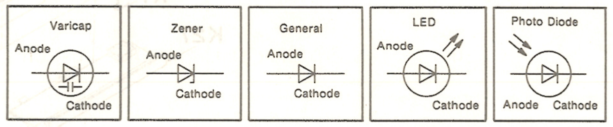

Soldering iron
Twezzers
Chip parts

Fig. 1


Varicap
Anode
Cathode
Zener
Anode
Cathode
General
Anode
Cathode
LED
Anode
Cathode
Photo Diode
Anode
Cathode